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Umbach, Frank

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Global Energy Supply and Geopolitical Challenges*

Frank Umbach

"Energy security concerns have always been central to geopolitical interests. Throughout history, the effort to secure access to energy sources and ensure adequate transport routes has demanded technological, commercial, diplomatic and military agility" (Fesharaki 1999).

"From the perspective of consuming countries, oil is [also] a strategic resource, given its decisive importance in industrial and military operations, equally in times of peace and war. Additionally, industrial countries provide both the capital and technology necessary for the oil's industry... All the problems of the energy world are closely intertwined with international relations. Oil matters have a scope much broader than that of mere economic and market affairs. The fact that oil is a vital commodity for both producers and consumers places it on top of the political and diplomatic agenda of our countries" (Araque 2001).

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1. Introduction: a view from Europe

The terrorist attacks of September 11, 2001 on the World Trade Center and the Pentagon, the major role played by Saudi Arabian terrorists belonging to the Al Qaida network in these attacks, the subsequent military intervention in Afghanistan and the recent Iraq war have reminded Europe and Asia how important energy security is for both regions. Indeed, energy supply security cannot be fully separated from questions of political stability in the most important oil and gas exporting countries. Consequently, international attention is now being focused more than ever on Central/South Asia and the Middle East/Persian Gulf as the future "arc of instability". Both regions (also defined together as the "Greater Middle East") are of utmost strategic importance for the stability of the world energy supply in the 21st century.

At the same time, the political, economic, technological, climatic and demographic conditions for a "new world order" will change dramatically in the 21st century. The economic rise of Asia, and above all China, has fuelled a boom in energy demand that raises countless foreign and security policy questions for both regional and global stability.

On top of these elements, EU's energy imports are expected to rise above 70% of the Union's energy requirements by 2020 (up from 50% today), thus making the region's future energy security more uncertain. In 2020, OPEC countries may cover 50% of the EU's oil demand by supplying 55 million barrels per day (Mb/d) against 32 Mb/d in 2000 (European Commission 2001). Today, around 30% of the EU's oil imports are supplied by the Middle East, while 41% of its natural gas imports come from Russia (and may exceed 60% after the EU's enlargement) and almost 30% from Algeria (European Commission 2001).

Furthermore, since the EU has for over 40 years failed to develop a consistent common energy policy within both the EU and the International Energy Agency (IEA), it lacks the means and tools to negotiate with, and exert pressure on, OPEC member-countries and other energy producer states.

In the United States, even before September 11, the new Bush-Administration had favored an energy strategy which envisaged the reduction of the US dependence on the volatile and unstable Middle East. Its present energy imports stand at a quarter of its total energy needs, and around 24% of its crude oil imports come from the Middle East. By contrast, Japan and Asia are today already much more dependent on the Middle East and the Persian Gulf for oil supplies (over 70% of their imports).

In the long-term, geographic diversification of the world's oil supplies will not be as easily achieved as for natural gas, since the world's reserves will increasingly be concentrated in the Middle East/Persian Gulf.

In the short-term, one has also to take into account that most oil-exporting countries have no significant spare production capacity. Regarding natural gas, vast amounts have been discovered in regions where both production and transport costs are now at economically viable levels - in particular Russia (Western Siberia), the Caspian region (including Iran), the Near East and Nigeria. Nonetheless, despite the fact that natural gas is available from a multitude of sources, the EU's current dependence on natural gas from Russia is already high, and this trend will further be enhanced when the Eastern European countries join the EU. The latter are much more dependent on natural gas imports from Russia, often from a single gas pipeline that links them to a single supplier country. Although Moscow has never failed to fulfil its supply obligations under its long-term contracts with the EU since the beginning of the 1980s (thus reflecting the economic and financial interdependencies between the EU and Russia), its pipeline plans and policies are not just determined by economic considerations but also by foreign policy and security interests. These often run contrary to the objective interests of the EU and countries in Eastern Europe, Central Asia and the Caspian region (Umbach 2003).

On the global level, primary energy demand will increase by 1.7% per annum, rising from more than 11 to over 15 billion tons of oil equivalent (Btoe) from 2000 to 2030. The major rise in demand will come from non industrialised countries, whose share in world demand will increase from just 30% to more than 40% in 2030.

In 2030, contrary to the over-optimistic projections of many proponents of renewable energies, fossil fuels will remain the primary sources of energy. They will meet more than 90% of the increase in demand until 2030. Although the use of natural gas will grow fast and renewables are becoming increasingly important, oil will remain the most significant energy source – projected to increase from 78 Mb/d in 2002 to 118 Mb/d in 2025 (a 50% growth; EIA 2003b). Moreover, almost all the increase in energy production will occur in non-OECD countries (IEA 2002). In these countries, any negative developments, be they economic or political, will have large adverse effects on Europe's future economic and political stability.

The objective of the paper is to clarify the geopolitical and security challenges for the future energy security of the EU and the Asia-Pacific Region. It will first discuss whether market factors are sufficient as the sole approach for the future energy poli-

cies in general, and then analyze the energy and supply challenges facing the EU and the Asia-Pacific Region (with a special focus on Japan and China). Special attention will be given to the implications of China's growing oil and gas imports on its foreign and security policies in a regional and global context.

The paper argues and concludes that the new energy security challenges for an expanded EU and for Asia are determined by the evolving dynamics of globalization. In the future, world-wide economic developments will increasingly be directly and indirectly influenced by domestic and regional political developments (and vice versa). The strategic developments in international relations since September 11 have already demonstrated persuasively that the future security, political stability and social cohesion of the EU and Asia will be increasingly influenced by the political stability of countries and regions outside of Europe (particularly in the Middle East, Central and South Asia, Asia-Pacific and Africa). Hence future energy security strategies, which are based solely on market mechanisms, are insufficient to guarantee the international stability of future energy supplies worldwide.

2. Can market factors alone guarantee future global energy security?

The threats to energy security

There are basically three sources of threat to energy supply security: economic, physical and environmental. They can also be divided into global and local energy security challenges. Beyond market factors, instability in energy prices or supply interruptions may result from a number of other disruptive factors: deliberate policies and actions by exporting countries, geopolitical disputes (both internal as well as regional conflicts) and the effects of exchange rates. Any disruptions to energy supply, whether actual or threatened, can have dramatic effects on society and the economy as we have seen over the last three years in California, New York, France and most recently in Italy and Great Britain - all having experienced serious disruptions of electricity supplies (Buchan 2002). Historically, we have witnessed three major disruptions in the last several decades: during the 1973 Arab-Israeli war, the Iran-Iraq war between 1980-1988 (first Gulf war) and the international war against Iraq after Saddam Hussein invaded Kuwait in 1990/1991. All these events were associated with an increase in consumer prices, a rise in unemployment rates and a decline in gross national product. But these supply disruptions had, fortunately, only short-term negative effects.

Table 1
A working classification of energy security events

Classification	Event
1. Global events	
a. Policy discontinuity	Reduction in output by producers, to raise prices
b. Fundamental discontinuity	Global shortage of production capacity
c. *Force majeure* disruption	Civil unrest, war, deliberate blockage of trade routes
d. Export disruption	Export cut-back by main exporters
e. Embargo disruption	Embargo by importers of a specific exporting state
2. Local events	
a. Embargo disruption	General embargo of specific importing state
b. Embargo disruption	Embargo of a specific importing state by a specific exporter or transit state
c. Logistical disruption	Accident, incident or terrorism, especially along transportation infrastructure
d. Local market disruption	By monopolist suppliers, by pressure groups, or through government mismanagement

Source: Andrews-Speed, Liao, Dannreuther (2002), p.14.

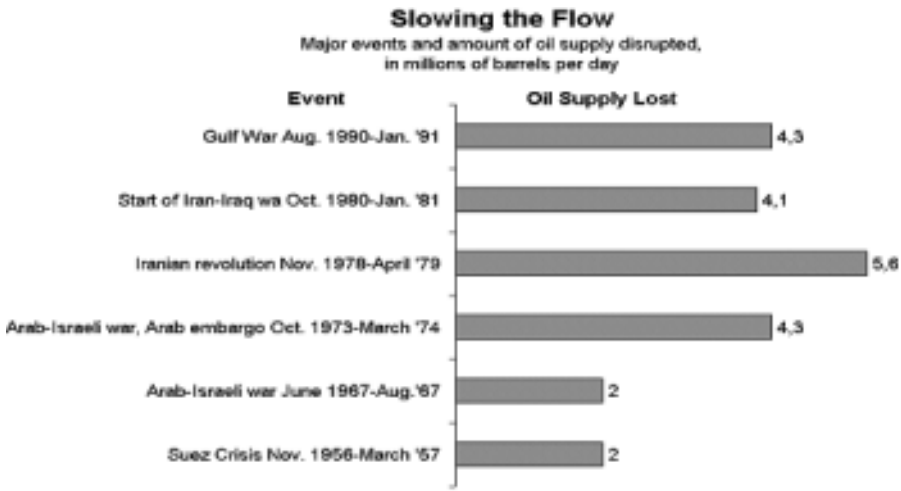
The responses to the threats and their limits

However, these crises have also offered some lessons. The disruptions of oil supply in the 1970s, for instance, led to international action to improve supply security through a package of new measures, including the newly created International Energy Agency (IEA) in Paris.

Having experienced physical shortages of energy and excessively high energy prices, the major Western energy importers have sought to ensure security of energy supplies through the following measures since the mid-1970s:

– by diversifying their energy mix, avoiding over-reliance on a single fuel;
– by diversifying their sources of imported energy;
– by pursuing the exploitation of domestic energy resources (expansion of nuclear energy);
– by building up strategic reserves of oil on their own territories;

Table 2
Oil supply disruptions 1956-1991



Source: Umbach (2003).

– by promoting energy efficiency and reducing the energy intensity of their economies; and
– in the case of the US, by actively taking a role in policing the Middle East (Lee 1998).

These measures have helped to strengthen international energy security which is commonly defined as "the availability of energy at all times in various forms, in sufficient quantities, and at affordable prices".

During the last decade, the principles of subsidiarity and liberalization as well as deregulation have given the EU member states more responsibilities for governing their own energy stocks. Furthermore, the political instability in the Middle East and Persian Gulf has persuaded many energy consuming nations to diversify their oil resources since the mid-1970s. There are however obvious limitations to such a strategy. In particular the high level of oil production rates in the North Sea will lead to a rapid depletion of oil fields until 2020. Today, The EU's oil dependence on OPEC countries still accounts for 42% of demand.

Emergency strategic reserves of oil and gas and traditional crisis measures, such as those set up by the IEA in 1974 (which stipulate that a country should have reserves

Table 3
Predicted changes in oil production capacity, 2000-2020

	2000		2010		2020		Change
Region	Mb/d	%[a]	Mb/d	%[a]	Mb/d	%[a]	%
Persian Gulf	23.9	30	29.6	31	42.2	38	+77
FSU	7.3	9	10.1	11	13.1	12	+79
Africa	2.6	3	3.3	3	5.5	5	+115
United States	9.1	11	9.0	9	8.7	8	- 4
North Sea	6.9	9	7.0	7	5.9	5	- 4
World	80.4		95.0		112.2		+40

Source: The Geopolitics of Energy, 2000, Vol. 1, p.23.
Note: Mb/d = million barrels per day.
a: Share of world total.

at a level of 90 days of net imports), and those provided for by Community legislation have certainly provided an important response to any external threats to supply or interruptions of supply. But the history and experiences of negotiations within the EU also show that effective co-ordination and co-operation are extremely difficult to achieve in practice, primarily because the EU itself has no mandate and related centralized decision-making mechanisms through which oil could be released timely onto the market. Furthermore, the lack of clear definitions as to what constitutes a crisis that would trigger the oil distribution plan has forced member states in the 1990s to set up their own independent inventories or strategic reserves for certain energy products. These national reserves, however, are not really harmonized and coordinated for physical supply disruption (European Commission 2002b, 2002a). The globalization of oil markets has made energy independence an anachronistic objective of energy policies with regards to demand-side measures, whereas energy interdependence has become a reality. This reality requires, nevertheless, intensive international cooperation.

The importance of geopolitical factors

While the increasing reliance on market forces has undoubtedly enhanced energy security, global market dynamics alone cannot guarantee full access to energy, particularly not when the energy is located in regions where market forces have a

mixed record and which are internally unstable and externally aggressive. Although the world is not confronted with an overall shortage of energy resources, geopolitical factors can constrain their actual availability. In this context, the following geopolitical security factors, which may affect the future global energy supplies, need to be taken into account:

– *Geopolitical Importance of the Middle East:* this region alone holds 65% of all globally proven oil reserves and 34% of all proven natural gas reserves. But given the fact that until 2020, the world energy demand will rise by almost 50 %, the Persian Gulf must expand its oil production by almost 80% (*The Geopolitics of Energy,* Vol 1, XVI). This is achievable only if sufficient foreign investment is made, if Iran and Iraq are free of sanctions and if the entire region remains politically stable!
– *Global Effects of the Lack of Spare Production Capability:* Globalization and commoditization of the oil market have forced the oil producing countries to minimize their excess capacity in order to compete with each other. Hence, most oil-exporting countries have no significant spare production capacity, with the only exception of Saudi Arabia. No other country can produce an additional 1-1.5 Mb/d to offset lost oil supplies on a global scale.
– *Good Governance versus Inequality in Regional Distribution of Oil Income:* The violent unrest in the Niger Delta in Nigeria during the last years is another example of future risks to energy security. The corruption plaguing governments of oil producing countries, mishandling oil income and unequally distributing revenues have led to political protest and internal violence. Thus, access to oil revenues enables authoritarian regimes to avoid transforming into publicly accountable regimes and has often hampered rather than hastened the transition to more pluralistic and democratic societies in the world (Ross 2001).
– *Multiple Crises and Conflicts in Oil and Gas producing Countries:* The years 2002 - 2003 were turbulent years in oil producing countries, be it the strike in Venezuela that brought oil production down from 3Mb/d to 400,000 b/d, the unrest in Nigeria, disruptions in Columbia, attacks on a French tanker, instability in Indonesia or the Middle East due to the Iraq war or even the earthquake in Alaska. The whole world seems increasingly unstable, a prospect to which even diversification offers little comfort. Furthermore, by 2020, 50% of global oil supplies will come from internally unstable countries, from those qualified by the US as sponsors of terrorism and "rogue states" (Libya, Iran, Iraq, Syria and Sudan), and who have not signed or ratified the main UN human rights conventions.

– "*Cheap Oil" as a Source of Economic and Political Instability:* Given the high dependence of many oil producing countries on their oil revenues, a dramatic decline in global energy consumption as the result of an economic recession and the ensuing drop in international oil prices could trigger domestic or even regional instability in many of the world's major energy-exporting countries (Myers Jaffe and Manning 2000). The 1997-98 Asian financial crisis was a case in point.
– *Increasing Terrorist Attacks on the Infrastructure of Energy Supplies:* In the last few years, terrorist attacks on oil and gas pipelines or crude thefts of oil have increased worldwide. Thus far, however, they have had only local impact and have not yet affected worldwide supply to a greater degree. But those attacks are expected to increase and widen further (such as on refineries, tankers etc.) with more serious and lasting consequences (Blanche 2002).
– *U.S. Embargoes:* The U.S. embargoes on Iraq, Iran and Libya, which together possess 22% of the world's oil reserves, have constrained the development of the petroleum sectors in these countries, although they could be an important source for alternative supplies in any major interruption of supply. The recent lifting of some U.S. sanctions on Iran and Libya must also be seen in this wider context of U.S. concerns over future global energy security.
– *Impacts of the Revolution of Military Affairs (RMA) on Regional Stability and Energy Supply Security:* Advances in weaponry and the RMA have led to an arms build-up in the Middle East as well as in the Asia-Pacific (the two most important regions for the future energy security challenges), whereas defense expenditures have been reduced in the rest of the world during the last decade. These technology acquisitions have increased the military capabilities of many countries in these two regions and therewith the vulnerability of shipping routes, especially the Sea Lanes of Communication (SLOC) in the Indian Ocean and Southeast Asia through which energy transits (Umbach 2002, 2001).

All this suggests that regional stability and security are pre-conditions to ensuring access to, and the free flow of, energy resources. Furthermore, the once sharp dividing line between foreign, domestic and economic policies is increasingly blurred in the age of globalization. Based on these developments, new crisis management mechanisms need to be created, for although these liberalization trends give the companies and regulators more responsibilities, these are still not clearly defined. Unlike oil, gas transportation depends on pipelines, and in the event of a crisis that inactivates a pipeline, most countries are currently unable to compensate those

physical gas disruptions. In the future, however, due to diversification of sources and means of supply, transporting Liquefied Natural Gas (LNG) by tankers from the different producing countries will help stabilize gas supplies in times of crisis as LNG shipments can be rerouted to other locations at minimal cost (whereas inactive pipelines need to be maintained and the supplier paid).

Against the background described above, the EU and Asia need a newly defined balance between the two strategies, the "strategic approach" (or "geopolitical approach") and the "market approach" (see also Table 4) in order to enhance energy security. The first strategy describes primarily state-sponsored economic measures with political initiatives, whereas the latter relies on the national and international energy markets, seeking to reduce the risk of disruption by improving the efficiency of these markets and allowing for government intervention. In the context of the EU, state-sponsored measures of a "strategic/geopolitical approach" need to be harmonized and coordinated between the EU-member states better than in the past or (preferably) need to be defined by the EU itself after it has received more authority to determine a much needed *Common Energy Policy (CEP).*

Even proponents of the market approach have warned not to overlook the inherent problems associated with it:

"By and large, deregulation of energy markets has meant that the establishment of inventories and the determination of their size have been left by governments to the markets to decide, except in the case of government-held emergency stores. But markets do not always send fully accurate signals. That is in part the result of a lack of market transparency and the realities that with imperfect information market participants tend to take the short view."

(Morse and Myers Jaffe ed. 2001).

3. The future energy security of the EU: overlooking geopolitical factors

"As long as the EU fails to develop means to reduce the influence of the international markets, this situation will remain the Achilles heel of the European economy and its ability to influence dialogue at world level will remain limited. As a result, the Union will be unable to pull its weight in international political debate"

(European Commission 2001).

Table 4
Summary and Classification of Possible Measures to Enhance Security of Oil Energy Supply.

	Strategic Approach	Market Approach
Supply-side economic measures to reduce probability of disruption	• Control through state companies • Self reliance • Investment in domestic and overseas production and transportation	*Liberalize energy markets:* • Integrate with international markets • Encourage domestic and international investment in production and transportation
Demand-side economic measures to reduce probability of disruption	*Use administrative measures to:* • Increase energy efficiency • Adjust transport policy • Diversify transport fuels	*Use market measures to:* • Increase energy efficiency • Adjust transport policy • Diversify transport fuels
Political measures to reduce probability of disruption	• Enhance political links with energy exporters • Outward investment and aid to energy exporters	Promote the efficient functioning on international energy markets
Measures to reduce impact of disruption	• Strategic storage • Oil sharing • Emergency response procedures • Fuel switching • Surge capacity	

Source: Andrews-Speed, Liao, Dannreuther (2002), pp.16-17.

Although energy questions dominated the negotiations leading up to the treaties of Paris (1951) and Rome (1957), the specific institutional provisions were made just for coal and nuclear industries (leading to the EURATOM treaty in 1957). In regard to oil, gas and renewable energy sources, each EU member is free to decide its own national energy policies.

EU members possess only about 0.6 % of the world's proven oil reserves, 2 % of the global gas reserves and 7.3% of proven coal reserves. In 2001, the EU produced 4.1% of the world's crude oil, 9% of global natural gas, and 11% of the world's coal. With its eastward extension, the EU will increase only its coal reserves substantially (by 41%), but not its oil and gas reserves.

Since the first oil crisis, Europe's economy has grown faster than its energy consumption. In 2002, the EU accounted for 16% of world energy consumption with just 6% of the world's population. In 2001, oil was still the dominant fuel, accounting for 43% of total EU energy consumption, followed by gas at 23%. Today the EU imports 27.5% of its oil from Eastern Europe (mainly Russia), 24.6% from the Middle East, 20.5% from Africa and 20% from Norway (EIA 2003a).

Since 1986, its energy demand has been growing at an annual rate of between one and two percent. Only the demand for electricity has grown faster. In 1999, electricity was generated by nuclear energy (35%), solid fuel (27%), natural gas (16%), hydro and other renewables (15%) and oil (8%). The future new capacity will be predominantly generated by gas while the number of oil and solid-fuel power stations will further decline. With the EU's enlargement policies, Europe's energy dependence will reach even more worrying perspectives. In November 2000, the EU's "Green Paper" warned that in the next 20-30 years, up to 70% of the Union's energy requirements (presently 50%) will have to be imported. In regard to oil, the EU's dependence could reach as much as 90%. Its dependence on imported gas will be of 70%, and for coal, 100% (EIA 2003a, 2002).

The EU's oil and gas imports cost the Union some euro 240 billion in 1999 or 6% of total imports and 1.2% of its GDP. In 2020, 45% of oil imports may come from the Middle East and more than 60% of natural gas from Russia. Hence the EU's long-term strategy for energy security has to focus, more than ever, on uninterrupted physical availability of energy products on the market. At the same time, respecting environmental concerns has become an even more important objective in the light of the Kyoto-protocol.

In the view of the EU Commission, security of supply is, together with environmental protection and economic efficiency, one of the three fundamental objectives of the Union's energy policy. The Green Paper has raised concerns about increased external dependence over the next few decades. It has therefore criticized the five (Germany, Sweden, Spain, Netherlands and Belgium) out of eight EU member states (the other three are France, the United Kingdom and Finland) with nuclear power who have announced a moratorium for nuclear power or have decided to give up nuclear energy production. Presently, nuclear energy plays a vital role in the sustainable production of electricity: in 2002 it produced more than 35% of electricity in Europe compared with just over one percent from wind power. It is also the only industrially mature energy source with negligible greenhouse gas emissions, which can be expanded. The Green Paper concluded starkly that the EU would not meet its obligations under the Kyoto-protocol without nuclear energy. Annually, it avoids some 300 million tons (Mt) of carbon dioxide emissions, equivalent to half the amount produced by all the cars in the EU.

If no significant changes are made in Europe's energy policy, the total energy picture in 2030 will still be dominated by fossil fuels. Although the energy demand is projected to rise much more slowly than GDP between 1998 and 2030, gross energy demand is expected to be 11% higher in 2030 than in 1998. Against this background, the EU has called for a common energy policy including a mix of energy strategies

Table 5
EU natural gas usage projections in 2020

EU natural gas usage projections in 2020 (assumes no enlargement)			
Scenario	**No replacement**	**If nuclear replaced**	**If nuclear and coal replaced**
Zero economic growth	370 Bcm	605 Bcm	820 Bcm
Slow economic growth	405 Bcm	665 Bcm	900 Bcm
Fast economic growth	500 Bcm	815 Bcm	1100 Bcm

Source: Europe's Energy Needs 2000, 2 sq.
Note: Bcm = billion cubic meters.

such as maintaining nuclear energy, improving energy efficiency, changing consumer behavior through taxation measures as well as doubling the share of renewable energies in the overall energy supply quota from 6 to 12% while also raising their share in electricity generation.

The expansion of natural gas as an environmental clean energy source will also be a very important factor for the EU member states in the next two decades. Gas consumption is expected to increase from 370 Bcm to 820 Bcm. But these figures assume no increase in overall energy consumption. If the energy consumption increases by 0.4% annually (as expected and as is the case in the U.S.) until 2020, then the EU gas consumption could rise to more than 900 Bcm. Furthermore, if Central European states are taken into account then the overall projected gas consumption for a united Europe is approximately 1250 Bcm (in current prices some $125 billion a year).

In October 2000, the EU and Russia, with its 48 trillion cubic meter (Tcm) reserves, declared the establishment of an "energy partnership". But whether the EU will expand its import dependence on Russia, particularly in regard to natural gas, by more than 50% after 2010 is uncertain due to important strategic interests, to Moscow's plans to diversify its exports to Asia and the U.S., and to Russia's energy policies themselves (liberalization, privatization and deregulation). While Russia primarily wants EU support to modernize its energy sector and protect its strategic position in Europe through the EU, the Union seeks the reform and opening of the Russian energy market through the creation of a positive business climate and market mechanisms. The ambivalent strategic interests of the Kremlin, also determined by Moscow's foreign and security interests, are reflected in its unwillingness to ratify the Energy Charter Treaty of 1994 and to sign the Transit Protocol. Both documents foresee that market mechanisms alone determine adequate oil and gas production and an expanded network of pipelines. At the same time, the EU lacks a comprehensive and strategically designed concept towards Central Asia and the Caspian region though it has the potential to become a major oil and natural gas exporter over the next decade (Umbach 2004a, 2003).

Meanwhile, after September 11, the European Commission tried to gain more control over Europe's oil stocks in an attempt to reduce price volatility and to deal with the increased risks of energy supplies. It intends to increase the oil stocks from 90 to 120 days of net imports and to acquire the power to make decisions on their use in times of emergency, in co-operation with producer countries (at present stocks are

Table 6
Potential natural gas exporters for Europe (Mt)

Supplier	Reserves	Current production	Current exports
Kazakhstan	1500-2300	7	- 0.8
Azerbaijan	310	5.6	0
Nigeria	3500	5.5	0
Saudi Arabia	5800	47	0
Libya	1300	6.5	1.1
Iran	23000	54	2.8
Qatar	8500	20	4.8
Uzbekistan	2100-2500	56	15
Turkmenistan	2900	25	21
Russia	*48000*	*600*	*205*

Source: *Europe's Energy Needs* 2000, p.4.

shared under rules of the IEA, but held within member states). At the same time, it has also planned to build up new strategic reserves of gas for 60 days in the event of supply disruption as well as a mechanism for sharing gas among member states. However, France, UK, and Germany have objected to these proposals by the Commission. They want oil and gas stocks to remain under the aegis of the IEA. In September 2003, the EU Parliament also rejected large parts of the EC's proposed measures, clearly because they tend to overlook a number of global strategic trends and the increasing (and not decreasing) risks associated with the EU's dependence on politically unstable regions and with geopolitical factors described above.

4. Japan's energy insecurity

Historically, deep concerns about securing access to raw materials, including oil, drove Japan into the Second World War, and shook Japanese bureaucrats during the oil shocks of the early 1970s. At present, Japan with the third-largest economy in the world is simultaneously the world's fourth largest energy consumer, the second largest energy importer (after the U.S.) and was until 2002 the world's second

largest oil consumer. It is heavily dependent on primary energy imports: these stand at around 80% of consumption. At present, 50% of its total energy demand is provided by oil, followed by coal (70%), nuclear power (14%), natural gas (14%), hydroelectric power (4%) and renewable sources (1.1%; EIA 2003c). Dependence on oil from the Middle East reached, in 2001, 86% of its total oil imports (Toichi 2003) and will rise further to 90% in 2010, though the share of oil in Japan's overall energy demand is expected to decline gradually due to the introduction of environ-

Table 7
Japan's primary energy supply outlook

	FY 1990		FY 1996		FY 2010			
	Actual	% Total	Actual	% Total	Case 1	% Total	Case 2	% Total
Oil (Mkl)	307	58.3	329	55.2	358	51.6	291	47.2
Oil (excluding LPG imports) (Mkl)	288	54.8	310	51.9	335	48.3	271	44.0
LPF (Mt)	14.35	3.5	15.23	3.3	17.50	3.3	15.10	3.2
Coal (Mt)	115.32	16.6	131.60	16.4	145.00	15.4	124.00	14.9
Liquefied natural gas (Mt)	37.91	10.1	48.19	11.4	60.90	12.3	57.10	13.0
Nuclear (TWH)	202.3	9.4	302.2	12.3	480.0	15.4	480.0	17.4
Hydroelectric (TWh)	91.2	4.2	82.2	3.4	105.0	3.4	105.0	3.8
Geothermal (Mkl)	0.50	0.1	1.16	0.2	3.80	0.5	3.80	0.6
Total new energy supply (Mkl)	6.73	1.3	6.85	1.1	9.40	1.3	19.10	3.1
Total primary energy supply (Mkl)	526	100.0	597	100.0	693	100.0	616	100.0

Source: Hideaki (2000), p.61.
Notes: Mkl = million kiloliters; LPG: liquefied petroleum gas; MT: million tons; TWh: terrawatt hours.

ment-clean liquefied natural gas following ratification of the Kyoto-protocol. All gas imports currently come in the form of LNG from Indonesia, Malaysia, Australia, Brunei, the United Arab Emirates, Qatar, Oman and Alaska. In 2000, with gas imports reaching 72.3 Bcm, Japan became the world's largest LNG market (IEA 2002). From 2008 to 2012, Japan has committed itself to reducing its green house gas emissions by 6% below their 1990 level.

Since the 1960s, diversification strategies, conservation measures and improving energy efficiency have all played an important role in implementing the primary goal of securing a stable supply of oil in Japan's energy security policy (Yamanouchi 1997 and Hideaki 2000). In 1967, Tokyo established the state-run Japan National Oil Company (JNOC) to assist in more than three hundred overseas oil and gas projects. But the original target to raise the ratio of oil produced by Japanese companies up to 30 % was never met (it is currently at 15%). Nonetheless, Japan also invested in 19 major storage companies to manage reserves equivalent to 78 days of oil consumption. Together with the strategic reserves held by private oil companies, Tokyo is prepared to deal with supply interruptions of less than 7 Mb/d for almost six consecutive months (approximately 171 days, albeit less in reality).

By sharing common energy security concerns with its neighboring Asian countries, Japan has proposed a multilateral energy system in East Asia which envisages also regional oil procurement and storage system ("Asian Strategic Petroleum Reserve/ASPR") in order to limit the vulnerability to oil supply disruptions and to ensure greater price stability on a regional level (Hideaki 2000, and Tsutomu 1998). It has also supported, financially and technically, many efforts for regional energy cooperation, including with China. More recently, the environmental factor has also become a new important element in Japan's more comprehensive energy security strategy. Against this background, Japan is confronted with the following three options for its energy security in the next decade: (1) an increasing reliance on nuclear power, (2) an enhancement of technologies to secure new energy supply (especially renewable energy sources as well as fuel cells), and (3) promotion of energy conservation (Yoichi 2002). Thereby, nuclear energy is the biggest "wild card" in Japan's future energy security. At present, Japan runs 53 nuclear reactors. Only the U.S. and France operate more nuclear power stations. According to the official long-term energy plans, the use of nuclear energy is projected to increase by 1.8% per year. Its share in the fuel mix will then rise from 13 to 18%. But for that, 16 to 20 new nuclear reactors must be built by 2010-2015. In 2030, Japan alone

could account for 21% of world nuclear power supply (IEA 2002). But Japan's public opinion has become increasingly wary of nuclear power as a result of a series of accidents at its nuclear power plants (like the one at the Tokaimura uranium processing plant in September 1999 and the recent shut down of all 17 nuclear reactors of Tokyo Electric Power Co./TEPCO for emergency inspections after the falsification of safety records since 1976). Moreover, uncertainties also exist in regard to the rising costs of the nuclear reactors themselves, fuel, fuel enrichment, reprocessing plants and nuclear waste disposal.

Japan also has very ambitious plans to develop renewable energies, particularly to increase photovoltaic capacity from 205 Megawatt (MW) at present to 5 gigawatt (GW) by 2010, projecting a 20% annual increase of solar-based energy from now to 2030 (Keiko 2003). Japan is already generating half of the world's solar power and has surpassed the US as the globally leading producer of solar panels – a market that is expected to grow fivefold by 2010 (Belson 2003). However, in the mid-term perspective of 2010-2020, its renewable energy will make only a modest contribution to improving the national energy security (just 3% of its primary energy demand) and to reducing the potential vulnerabilities of oil and gas supplies as well as global warming. In the longer term, Japan is also exploring the potential of gas (methane) hydrates production that may one day in the future replace oil and coal. Japanese hydrate deposits are estimated at about 7.4 trillion cubic meters (Tcm) of natural gas, equivalent to 100 times the current annual domestic consumption. But as is the case for many renewable energy sources, new technologies and other conditions have to make this new energy source competitive compared to existing ones (IEA 2002).

Although Japan has given market forces an increasing role in its energy security policies, fears of vulnerabilities of its oil and gas supplies from the Middle East remain. Japan is also facing increasing competition with China on pipeline projects in Russia and on oil fields in the Middle East (specifically after it lost the Arabian Oil Company's neutral zone concessions in Saudi Arabia and Kuwait; Brown and Wu 2003.) which could contribute to a rising strategic rivalry or even an energy resource conflict between both sides despite the ever growing economic interdependencies. Tokyo, therefore, currently needs to balance its foreign policy and security interests with its energy policies. These have come into conflict in two instances: The $2.5 billion deal to develop the massive Azadegan oil fields in Iran has been suspended for the time being because of Iran's unclear nuclear weapon ambitions

and the US pressure to cancel the deal. Reportedly, the oil pipeline project with Russia (to Nakhodka at the Sea of Japan), where Japan is also facing strong competition from China, is reflecting its rather unusual aggressive diplomatic offensive to win the Siberian pipeline vis-à-vis Beijing (Murphy 2003).

5. Future impacts of China's and Asia's dependency on energy from the Middle East

"The new realities of the world oil market suggest that the issue of security of oil supplies is no longer exclusively a strategic concern of the West. Asia's stake in securing reliable oil supplies is even greater because of the relative increase in its degree of dependence on oil from the Gulf"

(Chalabi 1998).

Regional dimensions

Due to dynamic economic growth in Asia and to the fact that 50% of the world's total population live in the region, the rise in energy consumption in this part of the world has been dramatic. As a result, the dependency of the Asia-Pacific states on crude oil imports rose to 58% in 1998 and is likely to rise to 68% by 2010 (Umbach 2002, 2003), with a key role played by Middle Eastern countries which supply more than 75% of the region's imports (Brown and Wu 2003).

While Indonesia, Malaysia, Brunei and Vietnam are still currently net oil exporters, some of these states are likely to become net importers by 2010 (Manning 2000). At present, the four major Asian economies (Japan, China, South Korea and India) already import more than 60% of their oil, and may even import up to 90% in 2020. This growth in demand will inevitably make Asia more vulnerable to any interruption in its oil supply especially from the Middle East. In comparison, in 2001, the US consumed 19,6 Mb/d, importing 54% but only 24% of it from the Middle East. A lower increase in energy demand in Asia is only possible if the People's Republic of China were to suffer a large-scale economic collapse. Even if economic growth were to fall to one percent over the next three years, the daily demand in 2010 would still be 9 Mb/d higher than in 1996. In this case, the increase alone would be greater than the total current production of Saudi Arabia! The reason for skepticism about any major slowdown in the consumption of primary energy in the Asia-Pacific region is found in the low level of per capita consumption, especially in China. Per

capita consumption of electricity in China currently amounts to only 8% (in India only 3%) of the OECD average (Manning 2000).
Asia's oil thirst is also having a worldwide impact. No other region of the world has recorded an increase of this scale in the last 25 years.

People's Republic of China (PRC)

The energy demand of the PRC, as the world's most populous country, will have a long-term impact on regional and global energy supplies as well as manifold effects upon Beijing's foreign and security policy, regional stability in Northeast, South and Central Asia and Beijing's relations with the U.S.A. and Europe. Energy security has always been a very sensitive subject in China, where self sufficiency was a mantra during Mao Zhedong's rule. Even today, the Chinese government regards energy as a "strategically vulnerable resource" (NAPSNET-Daily Report, 6 March 2003) and therefore as „high politics". With its 1.3 billion strong population, it is already the world's second-largest consumer of primary energy, the third-largest energy producer and, after the US, the largest contributor to global carbon dioxide (CO_2) emissions. Since 1990, China has been a net importer of energy. In November 1993 it also became a net importer of oil products and in 1996 of crude oil. These imports of oil and refined products are growing fast, whilst its crude oil reserves are limited (2.4% of global oil deposits). Although more than 90% of current Chinese oil is produced on the mainland, sustained production has been recorded in the East and South China Sea. But even if offshore production in China rises to 73 million barrels over the next few years (as China hopes), this will not be enough to compensate for even faster growth in the demand for oil and other sources of primary energy. In 2001, the PRC's imports increased by 15%, reaching 76.3 Mt, (NAPSNET-Daily Report, 20 March 2003), to increase by another 31% the following year, reaching 91 Mt (Mallet, 2004). Imports now account for a third of China's oil consumption and this trend is set to grow, reaching over 80% in 2030 (Mallet 2004, Kynge 2003b). These increases have meant that China has now taken Japan's place as the world's second largest oil consumer and as its growth continues it will alone be responsible for a third of the global increase in demand. Alongside India, the two will account for over half of the Asian increase in oil consumption in the next ten years (Brown and Wu 2003).
China currently accounts for more than 10% of the global primary energy demand. As one of the fastest growing economies in the world, China is already recognized as a

key-player in world energy markets. Due mainly to the vigorous demand of its transport sector, China's oil demand is projected to increase by 3% annually, amounting to 12 Mb/d by 2030, thereby more than doubling its current consumption. According to the IEA's projections, net oil imports will rise from 1.7 Mb/d in 2001 to 4.2 Mb/d in 2010, around 8 Mb/d in 2020 and at least 9.8 Mb/d in 2030 (IEA 2002, EIA 2003d).

Moreover, although China already has the second largest electricity capacity in the world, it is facing recurrent blackouts and power shortages, hence the need for electricity rationing. Recent industrial development has outstripped its supply of power. While Western experts had predicted a 3% growth in electricity demand, in reality it has risen by 15% in 2003. According to some estimates, China generates about 10% less electricity than it needs. The cost of China's power requirements is estimated at $108 billion over just the next five years. In 2003, 21 out of the total 32 provinces and regions experienced some form of power restrictions. In some areas, power shortages have already been crippling economic growth by cutting production, while hotels and restaurants had to dim lights and switch off heat (Song, 2003, Goodman 2004, Bradsher 2003, Kynge and Harney 2003a).

In order to reduce vulnerability to possible crisis scenarios in the oil producing states in the Middle East and Persian Gulf, China wants to stockpile around six million tons of crude oil as a strategic reserve by the year 2005 (FEER 2001, p.44). This reserve, however, may only cover the needs of China's oil refineries and petrochemicals industry for less than 3 days (compared to 90 days in the U.S.A. and 60 days in Japan; Chung 2001), in contrast to the officially projected 50-55 days' worth of oil imports by 2005.

Large deposits of natural gas have been found both in China and the entire Asia-Pacific region (Fesharaki, Wu and Banaszak 2000). However, the costs of constructing pipelines and liquefying plants are huge due to the long transportation routes. Nevertheless, and also for environmental reasons, China has made the increasing use of natural gas a high priority. China's gas consumption is believed to increase almost five-fold by 2030 (from 32 Bcm in 2000 to 61 Bcm in 2010 and 102 Bcm). The Chinese government hopes that gas will cover 8-10% of the country's entire energy consumption by 2010 (compared to slightly more than 3% today), whereas the IEA has forecasted that it will remain limited even in 2030 to 7% (IEA 2002). As a result of the growing gas consumption and LNG imports, however, China will become even more dependent on the Middle East and on a free flow of oil and gas resources in the SLOCs of the Indian Ocean and Southeast Asia.

Geopolitical implications

The predicted increase in global oil production, the increasing market orientation of national energy policies including privatization and deregulation of national energy sectors, combined with more efficient use of energy and energy saving measures could, in principle, solve the problems arising from the massive increase in oil consumption in China and East Asia, though some significant price increases cannot be excluded after 2010. The issue of energy security, however, depends not least of all, on the policies of the states concerned and the choice of national strategies for energy security. This is especially true of the Asia-Pacific region, where 60-70% of all crude oil imports are still arranged by contracts with state-owned or semi-state controlled Asian companies, that are not only concluded according to economic factors, but also according to strategic considerations (Suetsugu 1998). Given the new energy dependencies in the early 1990s, China's foreign and security policy had to deal with regions and countries that until then had played a minor, if any, role in its traditional foreign policy. For that reason, the possibility of greater economic and political rivalry over declining global oil reserves, in particular with Japan, India, the U.S.A. and, in the medium and long-term with Russia and even the EU in Central Asia, cannot be excluded.

Against the background of a rapidly growing demand and deteriorating prospects for major new energy discoveries on its own territory, the Chinese political leadership and managerial elite have been on the look out for new energy resources abroad since 1996/97. As early as 1990, China purchased 81.5% of its crude oil from only three foreign countries, although only Indonesia exported more than 1 Mt of crude oil to China. In 1997 the number of countries exporting more than 2 Mt of crude oil to China had doubled (these include Indonesia, Oman, Yemen, Angola, Iran and Vietnam). At that time, China already imported oil from all Gulf States except Bahrain (Guang 1998).

Since early 1997 China has developed an unusual policy of demonstrative activity while securing new sources of energy. China has participated in the development of oil fields in Russia, Pakistan, Kazakhstan, Indonesia, Egypt, Ecuador, Venezuela, Argentina, Iran, Iraq and Sudan. Until October 1997, China had concluded 126 contracts and agreements for a value of US$5.38 billion, signed with 67 companies from 18 countries (Shengliang and Xiaojie 2000). In 2002, China controlled more than 2.72 billion barrels of oil reserves outside its own territory by means of takeovers and international alliances (China's Quest 2002). These, steps, however, present new risks to China's future oil security.

Despite the fact that China has recently secured new supplies of oil and gas resources from Australia and Indonesia, the Persian Gulf region has steadily become more important not only for the energy policies of China and the other Asian states, but also for their national foreign and security policies. The increasingly global orientation of Chinese foreign and security policy, as seen by its activities in the Persian Gulf, Africa and even Latin America since the mid 1990s cannot be explained solely by China's increasing economic importance, prestige and its desire for great power status; to a considerable degree it is the result of China's energy requirements. Nonetheless, Asia's and China's high level of dependence on the Persian Gulf will increase further due to growing imports of natural gas from the same region. While natural gas pipelines are being constructed from Siberia and Sakhalin, Asia needs additional imports of LNG from the Middle East in tankers.

Due to heightened competition for energy resources and strategic access to the Persian Gulf through the Indian Ocean, an increasing strategic rivalry between China and Japan or India (whose oil imports also rose dramatically during the last decade) could lead to a rapidly escalating arms race, in particular between their naval and air forces (Calder 1997, Umbach 2002). These countries take a strategic view of energy security, and therefore favor reducing imports but also militarily safeguarding whatever imports they do have, instead of relying more heavily on market mechanisms, the requirements of globalization and transnational energy co-operations organized by the private sector.

While Beijing's policies in the Middle East and the Gulf region have largely been characterized by pragmatism and caution since the mid-1990s (Rynhold 1996), China's policy of arms exports to this region (Gill 2001, Grimmett 2000) and strong reservations about the U.S policy of "double containment" and non-proliferation have also had a negative impact on regional stability. These arms exports have also placed an additional strain upon bilateral relations between Beijing and Washington (Calabrese 1998, Myers Jaffe and Lewis 2002). Indeed, as admitted by Chinese energy and foreign policy experts, while China tended in the past to play a passive diplomatic role in the Middle East (declaring obvious platitudes about seeking peace and stability, but in reality not really caring too much about regional stability), today it has a lot at stake and pays much closer attention to the strategic developments in this region. Furthermore, China, like other Asian countries, has become increasingly concerned about the maritime terrorist attacks in the Persian Gulf and threats of piracy on Southeast Asian energy routes such as the Malacca Strait (Hordern 2004 and Blanche 2002).

Nonetheless, China's energy policies and "oil diplomacy" continue to give bilateral relations clear priority over multilateral strategies and solutions designed to safeguard its energy supply. But at the start of the 21st century, these are utterly inadequate to deal with the countless challenges raised by the process of globalization not only for international trade, but also for regional conflict management or international efforts in the field of arms control policy and non-proliferation of WMD and sensitive dual-use technologies. As a result, multilateral political strategies vis-à-vis the oil and gas producing nations of the Middle East and Central Asia (Caspian Basin) are badly wanted. Moreover, sources of instability in this part of the world might increase rather than decrease as highlighted in two UNDP reports "On Arab Human Developments" (UNDP 2002, UNDP 2003). Also, China could find itself exposed to growing political pressure from the oil and gas exporting states in the Middle East. This political pressure could result in either greater Chinese arms exports, including sensitive dual use goods and technologies, or in concessions by Beijing on other political issues that are contrary to Western policies and long-term strategic interests. Chinese support for the Russian and French positions on UN sanctions, their objections to military action against Iraq and to the Western policy toward Iran as well as problematic arms exports to various Gulf states (including ballistic missiles) in the 1990s have already demonstrated this problem (Myers Jaffe and Lewis 2002). In North Korea, barter and counter-trade deals such as "oil for weapons," have been the rule rather than the exception, while during the Iran-Iraq war China was a major exporter to the Persian Gulf states.

On the other hand, Chinese transactions of this kind declined significantly in the 1990s, as Beijing also supported the UN sanctions (Suetsugu 1998). Nevertheless, exports of Chinese ballistic missiles to the region have continued. A solution to this problem seems unlikely to be found in the near future because, in practical terms, China's present and future non-proliferation policy regarding ballistic missiles and other sensitive dual-use technologies, depends ultimately upon (i) the quality and stability of its bilateral relationship with the U.S.A.; (ii) on domestic vested interests of major policy and economic players as well as on (iii) the effectiveness of domestic control structures.

To end on a more positive note, increasing political and economic interdependencies could have a number of positive effects on the basic structures of the international system and on regional political stability in the Middle East. The long-term interest of the Chinese government in the regions' political stability could therefore increase, opening up greater possibilities of co-operation not only at the bilateral U.S.-

Chinese level (Manning 2000). Expansion of its political and economic, military and military-technology relations with the Middle Eastern countries will also give China an increasing degree of influence over them and strengthen Beijing's position at the global level (in the UN for example). At the same time, however, these energy and foreign policy dependencies are also a risk for Beijing as it can unwillingly be drawn into local or regional political conflicts, but without having a political influence comparable to that of the U.S.A. on the conflict.

6. Summary and perspectives

"A surplus in energy supplies during the past two decades convinced policymakers that other objectives could take precedence over energy security and that the costs of neglect would remain low. That period has ended. In today's tighter energy markets, the costs of leaving energy security unattended could become extremely high. These costs, and the means of reducing them, need to be evaluated in a more purposeful, strategic fashion."

(Morse and Myers Jaffe ed. 2001).

The main message of this paper is that different approaches to energy security (geopolitical/strategic factors versus market forces) should not be considered mutually exclusive but rather as complementary strategies.

The future stability of the global oil market will continue to depend heavily on the political situation in the Persian Gulf and the Greater Middle East which holds most of the world's proven reserves of oil and gas as well as basically all the world's spare oil production capacity.

In the case of Europe, the environmental obligations of the *Kyoto-Protocol*, phasing-out nuclear energy programs in important EU member states, and increasing depletion of oil and gas fields in the North Sea until 2020, mean that the EU will become much more dependent on oil and gas imports from outside Europe, and mostly from unstable countries and regions in the Middle East, Central Asia and Africa. Despite new energy saving measures and the promotion of renewable energy sources, oil and gas will remain the primary energy sources by 2025. Therefore, the EU and its member states need to take a global view in an age of growing interdependencies between domestic, external and economic security on the one hand, and local, regional and global political as well as socio-economic stability on the other hand. Accordingly, the EU needs to introduce a real global strategy that will secure

uninterrupted energy supplies and will be based on a new balance between market and strategic approaches, thereby taking into account, more than in the past, highly important geopolitical risk factors into a *Common Energy Policy* (CEP) and as an integral part of the *Common Foreign and Security Policy* (CFSP).

Traditional energy security concerns remain particularly valid in East Asia with its weak multilateral organizations, historical mistrust, unresolved security challenges (such as territorial conflicts), a regional arms build-up and rather increasing strategic rivalries between China and India as well as China and Japan. Although China has not (yet) become a destabilizing force for East Asia's energy security, two factors remain unclear: the first is whether China's economic and political stability can be maintained, the second is what will be the implications of China's energy security needs for its foreign and security policies. Beijing, for instance, at present neither trusts the U.S. nor has its own blue-water navy to ensure safe passage of its oil and gas imports.

More multilateral cooperation and engagement is very much needed in regional energy co-operation, one such form of cooperation could be the creation of an *Asian Strategic Petroleum Reserve.* It would not only promote cooperation in the event of a crisis, but also help to stabilize volatile markets and reduce the financial burden of maintaining national stockpiles. Proposals and discussions of an Asian version of the *IEA* are already underway to strengthen regional energy cooperation.

Although China, as the world's second largest energy consumer (after the U.S.), has made gradual progress toward deregulating its energy policies and integrating itself into the global economy in the 1990s, its efforts to orient its energy industry to the needs of the market since 1998 have, nevertheless, repeatedly faltered. Major energy policy decisions at the (state-run) energy corporations are still not made primarily, let alone solely, by economic criteria. They are also determined by the Politburo in Beijing, where foreign and security policy factors frequently play a central role, often to a rather unbalanced extent. In the future, however, neither unilateral-national strategies nor increased armaments to secure energy import routes by land or by sea will provide a real solution that will ensure reliable energy supplies for China. But it also seems rather unlikely that China will entrust the U.S. Navy with the task of securing its energy imports in the sea routes for much longer. At present, this dilemma appears almost insoluble to Beijing for domestic reasons.

At the same time, Russian, American and Japanese interest in China's energy strategy, oil in particular, is somewhat ambivalent, despite their common economic

and political interest in integrating China in regional and global cooperation structures. If pragmatism prevails in China and Russia and the reform policies continue on both sides, the outlook for a more balanced and stable relationship between Moscow and Beijing will never have been better. However, mutual distrust is still an important and often overlooked factor in the planned expansion of their energy ties (Umbach 2004b).

Given the manifold economic and political uncertainties in the Middle East, Central Asia and Russia, the three global energy bases that could potentially satisfy its long-term energy needs, China currently seems unable to define a coherent long-term energy policy. It also seems concerned by the related strategic decisions, such as the concrete level of Chinese dependency on the foreign energy market, the specific volume of investment in domestic oil and gas production, the concrete selection of long-term suppliers, and the feasibility of Central Asian and Russian pipelines. A long-term solution can only lie in international division of labor and a multilateral policy (e.g. the creation of a regional strategic oil reserve), which will meet the requirements of increasing globalization and of primary economic criteria and which will also promote the opening up to outsiders, deregulation and privatization of the Chinese energy sector. The international community, including the EU and Germany, cannot only offer new technologies for renewable energy sources (wind energy) and for improving energy efficiency but can also support multilateral approaches to solving energy security problems which would require a fundamentally co-operative foreign and security policy from Beijing. Although China has taken steps in this direction, many more and far greater steps will have to follow. Whether the events of September 11 have really led to a fundamental reversal and qualitative reorientation in bilateral relations between China and the U.S.A may be doubted at least for the mid- and long-term future. Nevertheless, since then, numerous areas of co-operation have been found that should not only benefit the U.S.A, but also help the EU to shape and concretize its CFSP toward China and Asia. The EU should, therefore, strive toward a strategic co-operation with China in *all areas* of energy policy, not only in China's interest but also in its own strategic interest, namely, because of its growing dependency upon energy from the Middle East and Persian Gulf. It would then also be able to exercise some influence over China's co-operative energy security strategies and, therewith, also over Beijing's foreign and security policies. In this context, a closer EU-Japanese co-operation on regional and global challenges to energy security would also be helpful for both

sides. The EU itself also needs to bring back energy security discussions into the public stage, especially since it is in the midst of an ongoing liberalization of its electricity and gas markets, thus making it even more urgent to develop a coherent energy strategy at the European level. These discussions should involve not just economic and energy experts, but also foreign and security policy specialists, as has been the case in the US in the last few years.

References

Araque, Ali Rodriguez (2001), "OPEC and the Geopolitics of the International Oil and Gas Industry", *OPEC Bulletin,* May, pp.5-7.

Belson, Ken (2003), "Solar Power Gains Converts in Oil-Starved Japan", *International Herald Tribune (IHT),* July 30, p.14.

Blanche (ed.) (2002), "Terror Attacks Threaten Gulf's Oil Routes", *Jane's Intelligence Review,* December, pp.6-11.

Bradsher, Keith (2003), "China Prospering but Polluting", *IHT*, October 22, p.1, 6.

Brooke, James (2004), "China and Japan vie Over Russian Oil Pipeline", *IHT*, January 3-4, p.8.

Brown, Jeffrey & Wu, Kang (2003), *"Key Players in the Asia-Pacific Oil Market",* Working Papers (East-West Center, Hawaii), No. 55, May.

Buchan, David (2002), "The Threat Within: Deregulation and Energy Security", *Survival*, Autumn, pp.105-116.

Calabrese, John (1998), "China and the Persian Gulf: Energy and Security", *Middle East Journal,* Summer, pp.351-366.

Calder, Kent (1997), *"Asia's Deadly Triangle. How Arms, Energy and Growth Threaten to Destabilize Asia-Pacific",* London-Sonoma.

Calder, Kent (1996), "Energy Forum", *Washington Quarterly,* Autumn, pp.91-95.

Chalabi, Fadhil (1998), "Gulf-Asia-Energy Interdependence", in John Calabrese (ed.), *Gulf-Asia Energy Security,* Middle East Institute, Washington, D.C., pp.13-21.

"China's Quest for Energy Independence" (2002), Stratfor.Com, 24 May (Subscription Service).

Chung, Chien (2001), "China's Energy Strategy in the 21st Century", *Peace Forum Essays,* Taipei (via Internet: <www.dsis.org.tw/peaceforum/p_2e.htm#7>).

EIA (2003a), "Regional Indicators: European Union (EU)", Washington, D.C., December (via Internet: <www.eia.doe.gov/emeu/cabs/euro.html>; downloaded on 29 December 2003).

EIA (2003b), "Key Energy Issues to 2025. Overview (Early Release)", Washington, D.C., 16 December (via Internet: <www.eia.doe.gov/oiaf/aeo/index/html>; downloaded on 29 December 2003).

EIA (2003c), "Japan. Country Analysis Brief", Washington, D.C., July (via Internet: <www.eia.doe.gov/emeu/cabs/japan.html>; downloaded on 12 December 2003).

EIA (2003d), "China. Country Analysis Brief", Washington, D.C., June (via Internet: <www.eia.doe.gov/emeu/cabs/china.html>; downloaded on 18 October 2003).

EIA (2003e), "Persian Gulf Oil and Gas Exports Fact Sheet", Washington, D.C., April (via Internet: <www.eia.doe.gov./emeu/cabs/pgulf.html>; downloaded on 29 December 2003.)

European Commission (2002a), *Proposal for a Directive of the European Parliament and of the Council concerning the alignment of measures with regard to security of supply for petroleum products,* Brussels, (via Internet: <http://europa.eu.int/comm/energy/home/internal_market/oil_gaz/index_en.htm>; downloaded on 29 December 2003).

European Commission (2002b), *Commission Communication to the European Parliament and the Council, The Internal Market in Energy: Coordinated Measures on the Security of Energy Supply,* Brussels, 11 September (via Internet: <http://europa.eu.int/comm/energy/home/internal_market/oil_gaz/index_en.htm>; downloaded on 29 December 2003).

European Commission (2001), *Green Paper. Towards a European Strategy for the Security of Energy Supply* (adopted by on November 29, 2000), Luxembourg.

"Europe's Energy Needs", 2000. Stratfor.Com, 6 November (Subscription Service).

Far Eastern Economic Review (FEER) (2001), "Asia 2002 Yearbook. A Review of the Events of 2001", Hong Kong.

Fesharaki, Fereidun, Wu, Kang and Sara Banaszak (2000), "Natural Gas: The Fuel of the Future in Asia", *Asia-Pacific Issues* (Analysis from the East-West-Center, Hawaii), No.44, June.

Fesharaki, Fereidun (1999), "Energy and the Asian Security Nexus", *Journal of International Affairs,* Autumn, pp.85-99.

Fujii Hideaki, "Japan", in Paul Stares (ed.), *Rethinking Energy Security in East Asia,* Tokyo-New York, pp.59-78.

"Gas Prices in Europe and U.S. to Remain Volatile", 2001, Stratfor.Com, 25 June (Subscription Service).

Gill, Bates (2001), "Two Steps Forward, One Step Back: The Dynamics of Chinese non-Proliferation and Arms Control Policy-Making in an Era of Reform", in David Lampton (ed.), *The Making of Chinese Foreign and Security Policy in the Era of Reform,* Stanford, pp.257-288.

Goodman, Peter S. (2004), "China's Dark Days and Darker Nights", *Washington Post,* January 5, p.A01.

Grimmett, Richard F. (2000), "Conventional Arms Transfers to Developing Nations, 1993–2000", Washington, D.C., Congressional Research Service (via Internet: <www.fas.org/asmp/resources/govern/crs.2000.pdf>).

Guang, Yang (1998), "China's Stabilizing Role", in John Calabrese (ed.), *Gulf-Asia Energy Security,* Middle East Institute, Washington, D.C., pp.39-46.

Guoxing, Ji (1998-1999), "China Versus Asian Pacific Energy Security", *Korean Journal of Defense Analysis,* Winter, pp.109-141.

Hideaki, Fujii (2000), "Japan", in: Paul Stares (ed.), *Rethinking Energy Security in East Asia,* Tokyo-New York, pp.59-78.

Hordern, Nick (2004), "East Asia Shores up its Energy Security", *Jane's Intelligence Review,* January, pp.42-44.

IISS (2003), *Strategic Survey 2002/3*. *An Evaluation and Forecast of World Affairs,* Oxford-London.

International Energy Agency (IEA) (2002), *World Energy Outlook 2002,* Paris.

Keiko, Omori (2003), "Switching on to New Energy Sources", *Look Japan,* September, pp.26-27.

Kynge, James and Alexandra Harney (2003a), "China's Sprint for Growth Runs into Power Shortage", *Financial Times (FT),* December 4, p.16.

Kynge, James (2003b), "Factory of World Vulnerable to the Side-Effects of Conflicts", *FT*, March 18, p.14.

Lee, Julian (1999), "International Energy Security: Prospects and Problems", in Joachim Krause, Bernhard May and Ulrich Niemann (eds.), *Asia, Europe and the Challenges of Globalisation,* Lectures From the First ASEF-Summer School 1998, Singapore, pp.165-186.

Mallet, Victor (2004), "China Unable to Quench Thirst for Oil", *FT*, January 21, p.1.

Manning, Robert A. (2000), "The Asian Energy Predicament", *Survival*, Spring, pp.73-88.

Morse, Edward L. and James Richard (2002), "The Battle for Energy Dominance", *Foreign Affairs,* March-April, pp.16-31.

Morse, Edward L. and Amy Myers Jaffe (eds.) (2001), *Strategic Energy Policy. Challenges for the 21st Century,* Report of an Independent Task Force, Washington, D.C., Council on Foreign Relations.

Myers Jaffe, Amy and Robert A. Manning (2000), "The Shocks of a World of Cheap Oil", *Foreign Affairs,* January-February, pp.16-29.

Myers Jaffe, Amy and Steven W. Lewis (2002), "Beijing's Oil Diplomacy", *Survival*, Spring, pp.115-134.

Ross, Michael L. (2001), "Does Oil Hinder Democracy?", *World Politics,* April, pp.325-361.

Rynhold, Jonathan (1996), "China's Cautious New Pragmatism in the Middle East", *Survival*, Autumn, pp.102-116.

Deng Shengliang and Xu Xiaojie (2000), "The Oil Dragon's Move: What It Means for China and the World", in Frank-Jürgen Richter (ed.), *The Dragon Millennium. Chinese Business in the Coming World Economy,* Westport, London, Quorum Books, pp.79-89.

Singh, Swaran (1999), "China's Energy Policy for the 21st Century", *Strategic Analysis,* March, pp.1871-1885.

Suetsugu, Katsuhiko (1998), "Energy Markets and Power Politics", in John Calabrese (ed.). *Gulf-Asia Energy Security,* Middle East Institute, Washington, D.C, pp.53-60.

The Geopolitics of Energy into the 21st Century. Vol. 1: An Overview and Policy Considerations; Volume 3: The Geopolitical Outlook, 2000-2020. Washington, D.C., November 2000.

Toichi, Tsutomu (2003), "Energy Security in Asia and Japanese Policy", *Asia-Pacific Review,* No.1, pp.44-51.

Toichi, Tsutomu (1998), "Necessary Interdependence. Building the Asian Energy Infrastructure", *Look Japan,* August, pp.14-16.

Umbach, Frank (2004a), *Security Partnership and Strategic Energy Resources. Policy Paper on Behalf of the European Parliament,* Berlin.

Umbach, Frank (2004b), "The Wounded Bear and the Rising Dragon – The Sino-Russian Relationship at the Beginning of the 21st Century: A View from Europe", *Asia-Europe Journal* 2004 (forthcoming).

Umbach, Frank (2003), *Globale Energiesicherheit. Strategische Herausforderungen für die europäische und deutsche Aussenpolitik ("Global Energy Security: Strategic Challenges for the European and German Foreign Policies")*, München, Oldenbourg Verlag (in German).

Umbach, Frank (2002), *Konflikt oder Kooperation in Asien-Pazifik? Chinas Einbindung in regionale Sicherheitsstrukturen und die Auswirkungen auf Europa ("Cooperation or Conflict in Asia-Pacific? China»s Tying into Regional Security Structures and the Implications for Europe"),* München, Oldenbourg Verlag (in German).

Umbach, Frank (2001), "Military Balance in the Asia-Pacific: Trends and Implications", in Anthony, Mely C. and Mohamed Jawhar Hassan (eds.), *The Asia Pacific in the New Millennium. Political and Security Challenges*, 14th Asia-Pacific Roundtable. June 2000. ISIS, Malaysia. Kuala Lumpur, pp.331-386.

UNDP (ed.) (2003), *Arab Human Development Report 2003. Building a Knowledge Society,* New York (via Internet: <www.undp.org/rbas/ahdr/ahdr2/English/Englishcomplete 2003.pdf>; downloaded 10 November 2003).

UNDP (ed.) (2002), *Arab Human Development Report 2002. Creating Opportunities for Future Generations,* New York (via Internet: <www.undp.org/ahdr; downloaded on 15 December 2002>).

Wonacott, Peter and Gregory L. White (2003), "Beijing Ventures Abroad to Slake its Thirst for Oil", *Wall Street Journal Europe,* December 19-21, p.1, 8.

Yamanouchi, Yasuhide (1997), "Nuclear Energy and Japan's Security Policy", *Japan Review of International Affairs,* No.3, pp.204-218.

Yoichi, Kaya, (2002), "Demanding Targets for Energy Conservation", *Look Japan*, January, pp.34-36.